

WHAT IS CLAIMED IS:

- 1 1. An impedance transformation network comprising:
2 an input node to receive an output signal;
3 an output node to transmit the output signal;
4 a fixed impedance transformation circuit connected between the
5 input node and the output node, the fixed impedance transformation circuit being
6 configured to provide a fixed impedance transformation to partially transform a
7 first impedance at the output node to a second impedance at the input node; and
8 a varactor device connected in series between the input node and
9 the output node, the varactor device being configured to provide a variable
10 impedance transformation in response to a power level of the output signal to
11 partially transform the first impedance at the output node to the second impedance
12 at the input node.
- 1 2. The impedance transformation network of claim 1 wherein the varactor
2 device includes a ferroelectric varactor connected in series between the fixed
3 impedance transformation circuit and the output node.
- 1 3. The impedance transformation network of claim 1 wherein the varactor
2 device includes a plurality of stacked ferroelectric varactors connected in series
3 between the fixed impedance transformation circuit and the output node.
- 1 4. The impedance transformation network of claim 1 wherein the fixed
2 impedance transformation circuit includes at least one transmission line on a
3 signal path between the input node and the output node and at least one shunt
4 capacitor connected to the signal path.
- 1 5. The impedance transformation network of claim 4 wherein the shunt
2 capacitor is a chip capacitor.

1 6. The impedance transformation network of claim 4 wherein the fixed
2 impedance transformation circuit includes at least one additional transmission line
3 on a second signal path between a supply voltage terminal and the signal path and
4 at least one additional shunt capacitor connected to the second signal path, the
5 second signal path at least partially being used to supply DC bias voltage to the
6 varactor device.

1 7. The impedance transformation network of claim 7 wherein the additional
2 shunt capacitor is a surface mount technology capacitor.

1 8. A method of transmitting an output signal to an output node, the method
2 comprising:
3 receiving the output signal at an input node; and
4 providing a variable impedance transformation between the input
5 node and the output node using a varactor device connected in series between the
6 input node and the output node, the variable impedance transformation being
7 provided in response to a power level of the output signal to transform a first
8 impedance at the output node to a second impedance at the input node.

1 9. The method of claim 8 wherein the varactor device includes a ferroelectric
2 varactor connected in series between the input node and the output node.

1 10. The method of claim 8 wherein the varactor device includes a plurality of
2 stacked ferroelectric varactors connected in series between the input node and the
3 output node.

1 11. The method of claim 8 wherein the receiving of the output signal included
2 receiving a radio frequency output signal at the input node.

1 12. The method of claim 8 further comprising providing a fixed impedance
2 transformation between the input node and the output node.

1 13. The method of claim 12 wherein the fixed impedance transformation is
2 provided by at least one transmission line on a signal path between the input node
3 and the output node and at least one shunt capacitor connected to the signal path.

1 14. The method of claim 13 wherein the fixed impedance transformation is
2 further provided by at least one additional transmission line on a second signal
3 path between a supply voltage terminal and the signal path, the second signal path
4 at least partially being used to supply DC bias voltage to the varactor device.

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1 15. A power amplifier comprising:
2 an amplifier configured to provide an output signal; and
3 an impedance transformation network including an input node and
4 an output node, the input node being connected to the amplifier, the output node to
5 be connected to a load, the impedance transformation network further including a
6 varactor device connected in series between the input node and the output node,
7 the varactor device being configured to provide a variable impedance
8 transformation in response to a power level of the output signal to transform a
9 load impedance at the output node to a desired impedance in a forward direction at
10 the input node, the forward direction being from the input node to the output node.

1 16. The power amplifier of claim 15 wherein the varactor device includes a
2 ferroelectric varactor connected in series between the input node and the output
3 node.

1 17. The power amplifier of claim 15 wherein the varactor device includes a
2 plurality of stacked ferroelectric varactors connected in series between the input
3 node and the output node.

1 18. The power amplifier of claim 15 wherein the amplifier is configured to
2 provide a radio frequency output signal.

1 19. The power amplifier of claim 15 wherein the impedance transformation
2 network comprises a fixed impedance transformation circuit connected to the
3 input node and the varactor device, the fixed impedance transformation circuit
4 including at least one transmission line on the signal path and at least one shunt
5 capacitor connected to the signal path.

1 20. The power amplifier of claim 19 wherein the fixed impedance
2 transformation circuit includes at least one additional transmission line on a
3 second signal path between a supply voltage terminal and the signal path and at
4 least one additional shunt capacitor connected to the second signal path, the
5 second signal path at least partially being used to supply DC bias voltage to the
6 varactor device.